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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/422,792	10/22/1999	CHIORI MOCHIZUKI	35.G2482	6000

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EXAMINER	
YE, LIN	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/422,792	MOCHIZUKI, CHIORI	
	Examiner	Art Unit	
	Lin Ye	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,11-18,21,23-30,52 and 53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,11-18,21,23-30,52 and 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 October 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/14/05 has been entered.

2. Applicant's amendments with respect to claims 1-8, 11-18, 21, 23-30, 52 and 53 filed on 07/14/05 have been considered but are moot in view of the new ground(s) of rejection.

Although a new ground of rejection has been used to address additional limitations that have been added to claims 1, 15, 23, 27 and 52, a response is considered necessary for several of the applicant's arguments since the Possin (U.S. Patent 5, 430,298) and Kobayashi (U.S. Patent 5,793,047) references will continue to be used to meet several of the claimed limitations.

Relative to claim claims 1, 15, 23, 27 and 52, the Applicant argues that "the Office is not understood to have satisfied the motivation-to-combine criteria of MPEP 2143.01", because Office action involves changing of the electrically conductive back contact layer 138 of the Possing reference to an insulating layer; but such a modification is to render the Possin device inoperative and therefore, unsatisfactory for its intended purpose, because the layer

138 would not be able to apply a bias voltage to the photodiodes 124 (See applicant's REMARKS page 1, lines 3-10).

The examiner disagrees. The Possing reference **never states** that one of ordinary skill in the art at the time cannot modify the electrically conductive back contact layer 138 including an insulating layer as an insulating substrate. The Kobayashi reference clearly teaches in Figures 5A-5C, the image pick-up apparatus comprising a substrate which includes an insulating substrate layer 21 and a lower electrode 22; a plurality of pixels (p-layer 23, i-layer 24 and n-later 25) arranged on the substrate (21 and 22); and in Figure 26, all substrates are bonded to on large substrate (80) which either is an insulating substrate (glass substrate) or electrically conductive substrate (copper plate) (See Col. 20, lines 4-8). The Kobayashi reference is evidence that one of ordinary skill in the art at the time to see more advantages for the system has more flexible option to add additional insulating material under electrically conductive material layer for a base substrate of image sensor so that all pixel elements in the image sensor can be completely protected and separated from each other. For that reason, it would have been obvious one of ordinary skill in the art at the time to modify the image pick-up apparatus of Possin ('298) for providing an additional insulating substrate layer under the layer 138 (e.g. the layer 138 is still be able to apply a bias voltage to photodiodes 124) for the sensor substrate as taught by Kobayashi ('047).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-2, 11, 15-16, 18, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Possin et al. U.S. Patent 5,430,298 in view of Kobayashi et al. U.S. Patent 5,793,047 and Lubowski et al. U.S. Patent 4,011,454.

Referring to claim 1, the Possin reference discloses in Figures 1-2, an image pick-up apparatus (computed topography imager apparatus 100 for detection of x-ray, see Col. 3, lines 44-46) comprising: a plurality of pixels (e.g., a plurality of photosensor devices 124), each pixel including a photoelectric conversion element and a switching element, arranged on an substrate (e.g., photo sensor array block 130 includes a substrate 138, see Col. 3, lines 61-63 and Col. 4, lines 24-25); a wavelength converter (scintillator 110, see Col. 3, lines 42-44) positioned and configured to convert incident radiation to light having light having a wavelength detectable by at least on of the photoelectric conversion elements; a protective layer (a pixel boundary light barrier 180, see Col. 3, lines 39-40) arranged on the substrate (138) so as to cover the plurality of pixels; and a flatterning layer (optical coupling layer 170, see Col. 3, lines 65-67) arranged at least on the plurality of pixels so as to be positioned upon a surface of the protective layer (180); wherein the wavelength converter is arranged by being deposited on the flattening layer (optical coupling layer 170) and comprises a scintillator (110); and wherein the plurality of pixels (130), the protective layer(180) and the

flattening layer are situated between the sensor substrate (138) and wavelength converter (110) as shown in Figure 1. However, the Possin reference does not explicitly shows the sensor substrate (138) can be add an additional insulating substrate layer instead of only electrically conductive substrate layer.

The Kobayashi reference teaches in Figures 5A-5C, the image pick-up apparatus comprising a substrate which includes an insulating substrate layer 21 and a lower electrode 22; a plurality of pixels (p-layer 23, i-layer 24 and n-later 25) arranged on the substrate (21 and 22); in Figure 15A, photoelectric conversion elements 4 are mounted on an insulating substrate (glass substrates 1) are to be bonded in the base 2 (See Col. 14, lines 34-37); and in Figure 26, all substrates are bonded to on large substrate (80) which either is an insulating substrate (glass substrate) or electrically conductive substrate (copper plate) (See Col. 20, lines 4-8). The Kobayashi reference is evidence that one of ordinary skill in the art at the time to see more advantages for the system has more flexible option to add additional insulating material under electrically conductive material layer for a base substrate of image sensor so that all pixel elements in the image sensor can be completely protected and separated from each other. For that reason, it would have been obvious one of ordinary skill in the art at the time to modify the image pick-up apparatus of Possin ('298) for providing an additional insulating substrate layer under the layer 138 (e.g. the layer 138 is still be able to apply a bias voltage to photodiodes 124) for the sensor substrate as taught by Kobayashi ('047).

The Possin reference does not explicitly shows a detail about the scintillator (110) comprises a columnar CsI columnar crystal.

The Lubowski reference discloses in Figures 1-3, an x-ray image intensifier comprising a structured scintillator screen produced by a vacuum evaporation process in which Cesium iodide (CsI) is evaporated from a source boat and deposited on a topographically structured surface to produce columnar scintillator elements (See Abstract section). The Lubowski reference is evidence that one of ordinary skill in the art at the time to see more advantages for the scintillator has a CsI columnar crystal so that to increase the proportion of light photons generated which leaves the upper surface when the column is thought of as extending up from the substrate (See Col. 2, lines 5-20). For that reason, it would have been obvious one of ordinary skill in the art at the time to see the scintillator (110) comprises a columnar CsI columnar crystal disclosed by Possin ('298).

Referring to claim 2, the Possin and Kobayashi references disclose all subject matter as discussed in respected claim 1, and the Possin reference discloses wherein the flattening layer (170) is obtained by flattening a protective layer (180) provided on the sensor substrate (substrate 138 can be insulating substrate as taught by Kobayashi reference) as shown in Figure 1.

Referring to claim 11, the Possin, Kobayashi and Lubowski references disclose all subject matter as discussed in respected claim 1, and the Lubowski reference discloses the scintillator comprises a CsI crystal (See Abstract section).

Referring to claim 15, the Possin, Kobayashi and Lubowski references disclose all subject matter as discussed with respected to same comment as with claim 1.

Referring to claim 16, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected to same comment as with claim 2.

Referring to claim 18, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected to claim 16, and the flattening layer is arranged on the plurality of insulating substrates (e.g., the Kobayashi discloses the plurality of insulating substrates such as insulating substrate layer 21 and large substrate 80).

Referring to claim 21, the Possin, Kobayashi and Lubowski references disclose all subject matter as discussed in respected to same comment as with claims 11 and 15.

5. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Possin et al. U.S. Patent 5,430,298 in view of Kobayashi et al. U.S. Patent 5,793,047, Lubowski et al. U.S. Patent 4,011,454 and Shigeta et al. Patent 5,739,548.

Referring to claim 3, the Possin, Kobayashi and Lubowski references disclose all subject matter as discussed in respected claim 1, except the references do not explicitly states the flattening layer comprises a polyimide resin.

The Shigeta reference teaches in Figure 5, a solid state imaging device comprising flattening layer (30) are formed out of any of the following combinations: a silicon oxide film and a phenol resin film; a fluorine resin film and a silicon oxide film; a fluorine resin film and an acrylic resin film; a fluorine resin film and a phenol resin film; a fluorine resin film and a polyimide resin film; a silicon oxide film and an acrylic resin film; a silicon oxide film and **a polyimide resin** film; and an acrylic resin film and a phenol resin film (See Col. 6, lines 63-67 and Col. 7, lines 1-6). The Shigeta reference is evidence that one of ordinary skill in the art at the time to see more advantages for flattening layer comprising a polyimide resin so that such the material can be melted into a liquid stat through a heat treatment for the

flattening layer and the flattening layer can be formed in a very small thickness (See Col. 3, lines 33-40). For that reason, it would have been obvious one of ordinary skill in the art at the time to see the flattening layer comprises a polyimide resin disclosed by Possin ('298).

Referring to claim 17, the Possin, Kobayashi, Lubowski and Shigeta references disclose all subject matter as discussed in respected to same comment as with claims 3 and 16.

6. Claims 4-8, 12-14, 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Possin et al. U.S. Patent 5,430,298 in view of Kobayashi et al. U.S. Patent 5,793,047, Lubowski et al. U.S. Patent 4,011,454 and Majewski et al. U.S. Patent 6,271,525.

Referring to claims **4 and 6**, the Possin, Kobayashi and Lubowski references disclose all subject matter as discussed in respected claim 1, except the references do not explicitly show a second flattening layer is provided on the wavelength converter so that the wavelength converter is flattened.

The Majewski reference discloses in Figures 1-4, an image pick-up apparatus comprising a wavelength converter (scintillator layer 12) for converting an incident radiation (gamma radiation); a flattening layer (bonding/protective layer 40, see Col. 3, lines 46-55) is provided on the wavelength converter (12). The Majewski reference is evidence that one of ordinary skill in the art at the time to see more advantages for an image pick-up apparatus comprising a flattening layer that is provided on the wavelength converter so that serving to cushion or protect the friable wavelength converter layer (12) from physical damage through shock (See Col. 3, lines 38-41). For that reason, it would have been obvious one of ordinary skill in the art at the time to modify the image pickup apparatus of Possin ('298) for providing the

second flattening layer on the wavelength converter so the wavelength converter is flattended as taught by Majewski ('525).

Referring to claim 5, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected claims 4 and 6, and the Majewski reference discloses wherein the second flattening layer (40) covers the end face of the wavelength converter as shown in Figure 1.

Referring to claim 7, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected claims 4 and 6, and the Majewski reference discloses wherein a light reflection film (a thin foil of aluminum layer 36) is provided on the second flattening layer (See Col. 3, lines 23-25).

Referring to claim 8, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected claim 4 and 6, and he Majewski reference discloses wherein a light reflection film (36) is provided on the flattened wavelength converter (12) as shown in Figure 1.

Referring to claim 12, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected claim 7, and the Majewski reference discloses wherein the light reflection film (a thin foil of aluminum layer 36) is made of an aluminum film.

Referring to claim 13, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected to same comment as with claims 8 and 12.

Referring to claim 14, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected claim 8, and the Possin reference discloses having plural sensor substrates (a plurality of photosensor devices 124 disposed on the layer 138 included in the sensor array block 130 in Figure 1).

Referring to claim 23, the Possin, Kobayashi and Lubowski references disclose all subject matter as discussed in respected to same comment as with claim 1, except the references do not explicitly show a signal processing means for processing the signal from the image pick-up apparatus, and display means for displaying the signal from the signal processing means.

The Majewski reference discloses a signal processor for processing the signal (digitizer 18 digitizes the output of array 16) from the image pick-up apparatus; and a display configured to for display the processed signal from the signal processor as shown in Figure 4 (See Col. 2., lines 55-65). The Majewski reference is evidence that one of ordinary skill in the art at the time to see more advantages for the image pick-up system including a signal processor for processing the signal from the image pick-up apparatus and a display means for displaying the signal form the signal processing so that user can review captured image from the display immediately. For that reason, it would have been obvious one of ordinary skill in the art at the time to modify the image pickup apparatus of Possin ('298) for providing the signal processing means for processing the signal from the image pick-up apparatus and display means for displaying the signal from the signal processing means as taught by Majewski ('525).

Referring to claim 24, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected to claim 23, and the Majewski reference discloses a telecommunication device configured to transfer the signal from the signal processor (See Col. 2, lines 64-65).

Referring to claim 25, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected to claim 23, and the Majewski reference discloses a recorder configured to record the signal from the signal processor (computer 20 is for recoding the signal output from digitizer 18).

Referring to claim 26, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed in respected to claim 23, and the Majewski reference discloses a storage device configured to store the signal from the signal processor (computer 20 inherently has a storage means that recoding the signal output from digitizer 18 and transfer data to remote location).

Referring to claim 27, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed with respected to same comment as with claim 23.

Referring to claim 28, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed with respected to same comment as with claim 25.

Referring to claim 29, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed with respected to same comment as with claim 24.

Referring to claim 30, the Possin, Kobayashi, Lubowski and Majewski references disclose all subject matter as discussed with respected to same comment as with claim 26.

7. Claims 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Possin et al. U.S. Patent 5,430,298 in view of Kobayashi et al. U.S. Patent 5,793,047, Lubowski et al. U.S. Patent 4,011,454 and Yamazaki et al. U.S. Patent 5,700,333.

Referring to claims 52-53, the Possin, Kobayashi and Lubowski references disclose all subject matter as discussed in respected to claim 1, except the Possin reference does not explicitly state the photoelectric conversion elements comprise non-crystalline semiconductor material, such as amorphous silicon film, etc.

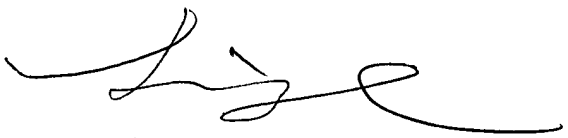
The Yamazaki reference discloses in Figure 1A, a thin-film photoelectric conversion device comprise non-crystalline semiconductor material (see Col. 3, lines 30-35), such as a amorphous silicon film (103), a silicon oxide film (102) and glass substrate (101) as an underlying layer (See col. 4, lines 26-42). The Yamazaki reference is evidence that one of ordinary skill in the art at the time to see more advantages photoelectric conversion elements comprise non-single crystalline semiconductor so as forming an excellent photoelectric conversion characteristic. For that reason, it would have been obvious one of ordinary skill in the art at the time to see the photoelectric conversion elements comprise non-crystalline semiconductor material, such as amorphous silicon film, etc., disclosed by Possin ('298).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin Ye whose telephone number is (571) 272-7372. The examiner can normally be reached on Mon-Fri 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lin Ye
Examiner
Art Unit 2615

September 26, 2005